

Work Order ID 99272

99272

Page 1

April 5, 2013 9:18:40 AM

Item ID: D6008-132 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube extrusion
 Start Date: 4/05/13 Start Qty: 12.00 ***12*** Cust Item ID:
 Required Date: 4/12/13 Req'd Qty: 12.00 ***12*** Customer:
 Reference:

Approvals: Process Plan: CL Date: 13/04/05 Tooling: Date: Run Start ***NR1***
 QC: Date: SPC (Y/N): Date: Stop ***NR2***

Work Center	Description	Est. Qty	Plan Code	Accept Qty	Reject Qty	Reject Number	Sp. Stamp
Draw Nbr	Revision Nbr						
D6008	Rev A						
100	PURCHASING	0.00					
100							
Purchasing	Memo	0.00					
Purchasing	Issue P/O: <u>14138</u>						
	a) Order as per Dwg D6008						
	b) Material: 3.250 x 0.438 wall 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) seamless aluminum tube						
	c) Minimum ultimate tensile strength = 77 ksi						
	d) Minimum tensile yield strength = 66 ksi						
	e) Tolerance are per ASTM B210 (see details on Dwg D6008)						
	f) Material certification required						
110	Receive & Inspect for Damage & Mat'l Certs	0.00					
110							
Packaging	Memo	0.00					
Packaging	Ensure material certification is attached						

CL 13/4/25 (12)

13/4/25 12

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data <input type="checkbox"/>											
Equip/Tooling <input type="checkbox"/>											
Operator <input type="checkbox"/>											
Material <input type="checkbox"/>											
Setup <input type="checkbox"/>											
Other <input type="checkbox"/>											
Process <input type="checkbox"/>											
Supplier <input type="checkbox"/>											
Training <input type="checkbox"/>											
Unapproved <input type="checkbox"/>											

FAULT CATEGORY			
Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions	<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other

Work Order ID 99272

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Page 2

April 5, 2013 9:18:40 AM

Item ID: D6008-132 Accept ***N900040100*** Setup Start ***NS1***
 Revision ID: Stop ***NS2***
 Item Name: Crosstube extrusion
 Start Date: 4/05/13 Start Qty: 12.00 ***12*** Cust Item ID:
 Required Date: 4/12/13 Req'd Qty: 12.00 ***12*** Customer:
 Reference:

Approvals: Process Plan: Date: Tooling: Date: Run Start ***NR1***
 QC: Date: SPC (Y/N): Date: Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	W Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 *120* QC Quality Control	QC6- Inspect dimensions to drawing Memo Ensure Material certification comply to Dwg D6005	0.00 0.00							
130 *130* Packaging Packaging	Identify as per dwg & Stock Location: <u>L/6</u> Memo	0.00 0.00							
140 *140* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00							

DAS
16
2-89 13/5/01

Please see minutes
Revised material 13/5/01
1

(x12)

gman
13/05/01

13/7/16

CL 13/07/01

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____				DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>		AGAINST DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/> </div> <div> Water Jet <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/> </div> </div>					
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector		
Doc/Data <input type="checkbox"/> Equip/Tooling <input type="checkbox"/> Operator <input type="checkbox"/> Material <input type="checkbox"/> Setup <input type="checkbox"/> Other <input type="checkbox"/> Process <input type="checkbox"/> Supplier <input type="checkbox"/> Training <input type="checkbox"/> Unapproved <input type="checkbox"/>											

FAULT CATEGORY									
Landing Gear			General						
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain	<input type="checkbox"/> Ovalized	<input type="checkbox"/> Pressure/Forced					
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware	<input type="checkbox"/> Over/Under tolerance	<input type="checkbox"/> Temperature/Cure					
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Part Incorrect	<input type="checkbox"/> Weld					
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Part Lost/Missing	<input type="checkbox"/> Wrong Stock Pulled					
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Part Moved						
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled	<input type="checkbox"/> Positioned Wrong						
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread	<input type="checkbox"/> Power Loss/Surge	<input type="checkbox"/> Other					
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset							
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration							
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence							
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions							

Picklist Print

April 5, 2013 9:18:40 AM

Page 1

Work Order ID: 99272

Parent Item: D6008-132

Parent Item Name: Crosstube extrusion

Start Date: 4/05/13

Required Date: 4/12/13

Start Qty: 12.00

Required Qty: 12.00

Comments: IPP Rev:A New Issue 07-06-18 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6008-132P Crosstube extrusion		Purchased	No			110	Each	0.0000	1	12		4/13/13/20	(12)

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION <div style="display: flex; justify-content: space-around;"> <div>Rework <input type="checkbox"/></div> <div>Skid-tube <input type="checkbox"/></div> <div>Crosstube <input type="checkbox"/></div> <div>Water Jet <input type="checkbox"/></div> <div>Engineering <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-around;"> <div>Scrap <input type="checkbox"/></div> <div>Machining <input type="checkbox"/></div> <div>Small Fab <input type="checkbox"/></div> <div>Prod. Eng. Coord. <input type="checkbox"/></div> <div>Quality <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-around;"> <div>Use-as-is <input type="checkbox"/></div> <div>Thermoforming <input type="checkbox"/></div> <div>Finishing <input type="checkbox"/></div> <div>Rec/Store/Packaging <input type="checkbox"/></div> <div>Other <input type="checkbox"/></div> </div> <div style="display: flex; justify-content: space-around;"> <div>Work Order Update <input type="checkbox"/></div> <div>Large Fab <input type="checkbox"/></div> <div>Composite <input type="checkbox"/></div> <div>Supplier <input type="checkbox"/></div> </div>	
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Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

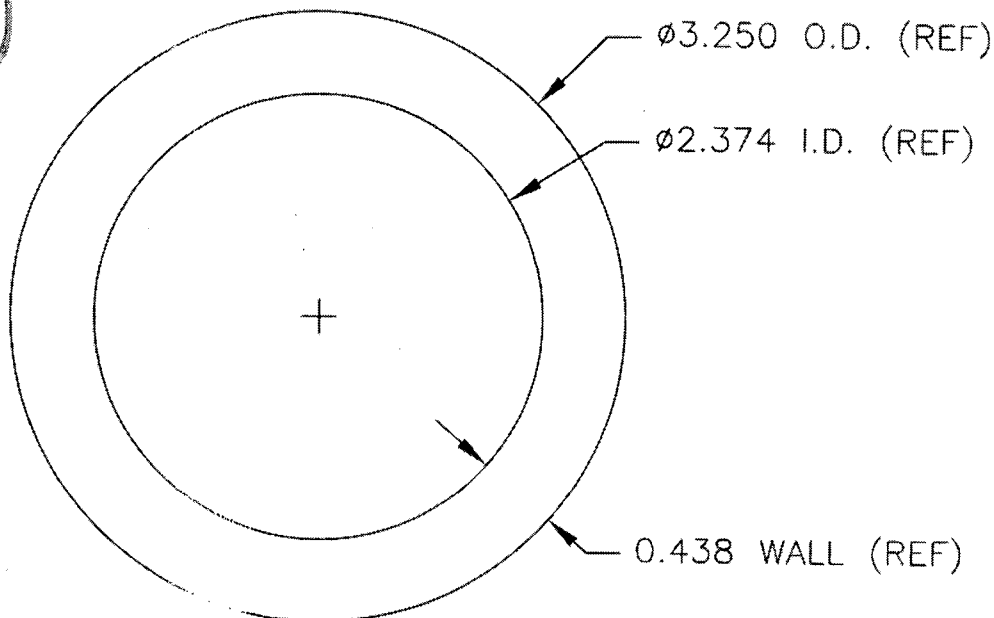
Landing Gear	General	Other
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions
		<input type="checkbox"/> Ovalized
		<input type="checkbox"/> Over/Under tolerance
		<input type="checkbox"/> Part Incorrect
		<input type="checkbox"/> Part Lost/Missing
		<input type="checkbox"/> Part Moved
		<input type="checkbox"/> Positioned Wrong
		<input type="checkbox"/> Power Loss/Surge
		<input type="checkbox"/> Pressure/Forced
		<input type="checkbox"/> Temperature/Cure
		<input type="checkbox"/> Weld
		<input type="checkbox"/> Wrong Stock Pulled
		<input type="checkbox"/> Other



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>[Signature]</i>	APPROVED <i>[Signature]</i>	DRAWING NO. D6008	REV. A SHEET 1 OF 1
DATE 00.11.17		TITLE CROSSTUBE MATERIAL	SCALE 1:1
A	00.11.17	NEW ISSUE	

SPECIFICATION CONTROL DRAWING

RELEASED
00.11.24 *[Signature]*



NOTES

- 1) D6008-XXX CROSSTUBE
LENGTH

CL13/04/05
W10: 99272

WHERE XXX IS LENGTH IN INCHES
EG. 180" LONG TUBE: D6008-180

- 2) MATERIAL: 3.250 OD x 0.438 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ASTM B310 AS FOLLOWS:
O.D.: ± 0.008 MEAN (± 0.016 INCLUDING OVALITY)
WALL: ± 0.020 MEAN (± 0.044 INCLUDING ECCENTRICITY)
LENGTH: XXX $+0.125/-0.000$
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

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NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA: _____ Date: _____

QA Closed: _____ Date: _____

Work Order: _____ Part No. _____ NCR No. _____	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update <input type="checkbox"/>	AGAINST DEPARTMENT/PROCESS <table style="width: 100%;"> <tr> <td>Skid-tube <input type="checkbox"/></td> <td>Crosstube <input type="checkbox"/></td> <td>Water Jet <input type="checkbox"/></td> <td>Engineering <input type="checkbox"/></td> </tr> <tr> <td>Machining <input type="checkbox"/></td> <td>Small Fab <input type="checkbox"/></td> <td>Prod. Eng. Coord. <input type="checkbox"/></td> <td>Quality <input type="checkbox"/></td> </tr> <tr> <td>Thermoforming <input type="checkbox"/></td> <td>Finishing <input type="checkbox"/></td> <td>Rec/Store/Packaging <input type="checkbox"/></td> <td>Other <input type="checkbox"/></td> </tr> <tr> <td>Large Fab <input type="checkbox"/></td> <td>Composite <input type="checkbox"/></td> <td>Supplier <input type="checkbox"/></td> <td></td> </tr> </table>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>	Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>	
Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>															
Machining <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Prod. Eng. Coord. <input type="checkbox"/>	Quality <input type="checkbox"/>															
Thermoforming <input type="checkbox"/>	Finishing <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Other <input type="checkbox"/>															
Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Supplier <input type="checkbox"/>																

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data									
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY

Landing Gear <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube	General <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio	<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions
		<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge
		<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Other

Packinglist ALUnna AG

ALUnna ref. no.	42438/6
Customer PO.	Po. 14138
Date:	03.07.13

Boxmarking:

Dart Aerospace PO. 14138
D6008 - 132
Made in Germany Dest.: Hawkesbury Ont, Canada

B 69790

We hereby declare that the wooden packing material are totally free from bark and apparently

free from live plant pests

[illegible]

Abnahmeprüfzeugnis 3.1 - DIN EN 10204:2005

Inspection Certificate 3.1 - DIN EN 10204:2005 / Certificat de Reception 3.1 - DIN EN 10204:2005

Kunde: Dart Aerospace Ltd.
Client:

1270 Aberdeen Street
K6A1K7 Hawkesbury, ON Canada

Zeugnisnummer: 432/12

Cert No. / No. du certificat:

Bestellnummer:

Order No. / No. de commande

Auftrag:

Our Reference/Notre Reference:

Produkt:

Product / Produit:

Soeefifikation:

Specification:

Werkstoff:

Alloy/Alliage:

Abmessung

Size / Dimension

Kennzeichnung

Marking/Marquage:

7075

3,250 INCH x 2,374 INCH x 0,438 INCH x 132,000 INCH

D6008-132 3.250 X 0.438 X 132

Cert. No. 432/12 - ALUnna - 7075 - T6511 - Cast No. 84070 - AMS - QQ - A - 200/11 - 3.250" OD x 0.438" Wall - Heat Lot No. 1401164 - ALUnna Order Conf. No. 42438/6-1 - P.O. 14138

Zustand:

Temper/Etat

T 6511

Country of Manufacture: Germany

Products are in accordance with applicable RoHS

Elemente ohne Grenzwerte:

einzel max. 0,05 %, insgesamt 0,15 %

1. Chemische Analyse

Chemical Analysis / analyse chimique

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Pb	Zr	Bi	Sn	Ni
Charge/ min.			1,2		2,1	0,18	5,1						
Cast No. max.	0,40	0,50	2,0	0,30	2,9	0,28	6,1	0,20					
84070	0,07	0,13	1,43	0,04	2,47	0,19	5,79	0,03	0,01	0,02			0,0001

Hydrogen content: 0,14

ccm/100 g Al Elements without indication < 0,01 %

country of melt manufacturer: Germany

2. Mechanische Eigenschaften

Mechanical Properties / Valeurs Mécaniques

Anforderungen Requirements	tensile (Rm) ksi	yield (Rp0,2) ksi	elongation 2" %	elongation A %	Hardness HB	Heat Lot No.
min.	77,0	66,0				
max.						
1	84,825	77,430	10,0			1401164
2	85,405	77,720	9,0			

max. RMS 25 - max. 19,0 µ"

Ergebnis der Prüfungen:

Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results:

We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Resultats:

Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

EXTRUSION INSPECTION SHEET

		SIDE A	SIDE B					ULTRA SONIC MEASUREMENTS				
TUBE #	TOTAL LENGTH	DIA two readings	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Strightness at 12" in middle	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
DWG	132.00"	3.250"		2.374"	0.438"	0.010"	N/A	Middle	N/A			
1	132.000"	3.242"/3.246"	3.244"/3.253"	2.363"	0.439"/0.444"	0.0115"	N/A	Middle	0.439"	0.443"	0.445"	0.442"
2		3.243"/3.248"	3.243"/3.249"	2.360"	0.435"/0.444"	0.009"	N/A	Middle	0.440"	0.445"	0.440"	0.446"
3		3.248"/3.244"	3.241"/3.246"	2.361"	0.447"/0.442"	0.0055"	N/A	Middle	0.431"	0.438"	0.450"	0.441"
4		3.243"/3.247"	3.240"/3.248"	2.360"	0.445"/0.442"	0.005"	N/A	Middle	0.442"	0.442"	0.440"	0.436"
5		3.246"/3.243"	3.244"/3.247"	2.360"	0.435"/0.441"	0.0075"	N/A	Middle	0.443"	0.453"	0.439"	0.433"
6		3.243"/3.247"	3.241"/3.248"	2.363"	0.429"/0.444"	0.0095"	N/A	Middle	0.446"	0.432"	0.437"	0.448"
7							N/A	Middle				
8							N/A	Middle				
9							N/A	Middle				
10							N/A	Middle				
11							N/A	Middle				
12							N/A	Middle				
13							N/A	Middle				
14							N/A	Middle				
15							N/A	Middle				
PART # D6008-132		P/O# 14138 (replacment)			BATCH # B99272			Notes: these were a replacment for a B69799				

MEAN OUTSIDE DIAMETER PERMISSIBLE +- 0.006 side A									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.242	3.246	3.244	3.250	0.006	3.244	3.256	0.000	-0.012
2	3.243	3.248	3.246	3.250	0.006	3.244	3.256	0.001	-0.011
3	3.245	3.244	3.245	3.250	0.006	3.244	3.256	0.001	-0.011
4	3.243	3.247	3.245	3.250	0.006	3.244	3.256	0.001	-0.011
5	3.246	3.243	3.245	3.250	0.006	3.244	3.256	0.000	-0.011
6	3.243	3.247	3.245	3.250	0.006	3.244	3.256	0.001	-0.011
7			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
8			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
9			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
10			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
11			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
12			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
13									
14									
15									
16									

MEAN OUTSIDE DIAMETER PERMISSIBLE +- 0.006 Side B									
Tube #	Actual A	Actual B	Mean	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.244	3.253	3.249	3.250	0.006	3.244	3.256	0.004	-0.007
2	3.243	3.249	3.246	3.250	0.006	3.244	3.256	0.002	-0.010
3	3.241	3.246	3.244	3.250	0.006	3.244	3.256	-0.001	-0.012
4	3.240	3.248	3.244	3.250	0.006	3.244	3.256	0.000	-0.012
5	3.244	3.247	3.246	3.250	0.006	3.244	3.256	0.001	-0.011
6	3.241	3.248	3.245	3.250	0.006	3.244	3.256	0.001	-0.011
7			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
8			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
9			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
10			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
11			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
12			#DIV/0!		0.006	-0.006	0.006	#DIV/0!	#DIV/0!
13									
14									
15									
16									

OUTSIDE DIA. Permissible (with Ovality) +- 0.012 side A							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.242	3.250	0.012	3.238	3.262	0.004	-0.020
2	3.243	3.250	0.012	3.238	3.262	0.005	-0.019
3	3.245	3.250	0.012	3.238	3.262	0.007	-0.017
4	3.243	3.250	0.012	3.238	3.262	0.005	-0.019
5	3.246	3.250	0.012	3.238	3.262	0.008	-0.016
6	3.243	3.250	0.012	3.238	3.262	0.005	-0.019
7			0.012	-0.012	0.012	0.012	-0.012
8			0.012	-0.012	0.012	0.012	-0.012
9			0.012	-0.012	0.012	0.012	-0.012
10			0.012	-0.012	0.012	0.012	-0.012
11			0.012	-0.012	0.012	0.012	-0.012
12			0.012	-0.012	0.012	0.012	-0.012
13							
14							
15							
16							

OUTSIDE DIA. Permissible (with Ovality) +- 0.012 side b							
Tube #	Actual A	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.244	3.250	0.012	3.238	3.262	0.006	-0.018
2	3.243	3.250	0.012	3.238	3.262	0.005	-0.019
3	3.241	3.250	0.012	3.238	3.262	0.003	-0.021
4	3.240	3.250	0.012	3.238	3.262	0.002	-0.022
5	3.244	3.250	0.012	3.238	3.262	0.006	-0.018
6	3.241	3.250	0.012	3.238	3.262	0.003	-0.021
7			0.012	-0.012	0.012	0.012	-0.012
8			0.012	-0.012	0.012	0.012	-0.012
9			0.012	-0.012	0.012	0.012	-0.012
10			0.012	-0.012	0.012	0.012	-0.012
11			0.012	-0.012	0.012	0.012	-0.012
12			0.012	-0.012	0.012	0.012	-0.012
13							
14							
15							
16							

OUTSIDE DIA. Permissible (with Ovality) +- 0.012 side A							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.246	3.250	0.012	3.238	3.262	0.008	-0.016
2	3.248	3.250	0.012	3.238	3.262	0.010	-0.014
3	3.244	3.250	0.012	3.238	3.262	0.006	-0.018
4	3.247	3.250	0.012	3.238	3.262	0.009	-0.015
5	3.243	3.250	0.012	3.238	3.262	0.005	-0.019
6	3.247	3.250	0.012	3.238	3.262	0.009	-0.015
7			0.012	-0.012	0.012	0.012	-0.012
8			0.012	-0.012	0.012	0.012	-0.012
9			0.012	-0.012	0.012	0.012	-0.012
10			0.012	-0.012	0.012	0.012	-0.012
11			0.012	-0.012	0.012	0.012	-0.012
12			0.012	-0.012	0.012	0.012	-0.012
13							
14							
15							
16							

OUTSIDE DIA. Permissible (with Ovality) +- 0.012 side b							
Tube #	Actual B	Nominal	Tolerance	min allowable dimension	max allowable dimension	Results for min allowable	Results for max allowable
1	3.253	3.250	0.012	3.238	3.262	0.015	-0.009
2	3.249	3.250	0.012	3.238	3.262	0.011	-0.013
3	3.246	3.250	0.012	3.238	3.262	0.008	-0.016
4	3.248	3.250	0.012	3.238	3.262	0.010	-0.014
5	3.247	3.250	0.012	3.238	3.262	0.009	-0.015
6	3.248	3.250	0.012	3.238	3.262	0.010	-0.014
7			0.012	-0.012	0.012	0.012	-0.012
8			0.012	-0.012	0.012	0.012	-0.012
9			0.012	-0.012	0.012	0.012	-0.012
10			0.012	-0.012	0.012	0.012	-0.012
11			0.012	-0.012	0.012	0.012	-0.012
12			0.012	-0.012	0.012	0.012	-0.012
13							
14							
15							
16							

end measuement with vern

Mean OUTSIDE DIA. Permissible +- 0.015									
Tube	Actual A	Actual B	Mean	Nominal	Tolerance	min	max	min	max
1	0.439	0.444	0.442	0.438	0.015	0.423	0.453	0.0185	-0.012
2	0.435	0.444	0.440	0.438	0.015	0.423	0.453	0.0165	-0.014
3	0.442	0.447	0.445	0.438	0.015	0.423	0.453	0.0215	-0.009
4	0.445	0.442	0.444	0.438	0.015	0.423	0.453	0.0205	-0.010
5	0.441	0.435	0.438	0.438	0.015	0.423	0.453	0.015	-0.015
6	0.444	0.429	0.437	0.438	0.015	0.423	0.453	0.0135	-0.017
7			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
8			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
9			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
10			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
11			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
12			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
13			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
14			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
15			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!

OUTSIDE DIA. Permissible +- 0.038								
Tube	Actual A	Actual B	Nominal	Tolerance	min	max	min	max
1	0.439	0.444	0.438	0.038	0.400	0.476	0.039	-0.032
2	0.435	0.444	0.438	0.038	0.400	0.476	0.035	-0.032
3	0.442	0.447	0.438	0.038	0.400	0.476	0.042	-0.029
4	0.445	0.442	0.438	0.038	0.400	0.476	0.045	-0.034
5	0.441	0.435	0.438	0.038	0.400	0.476	0.041	-0.041
6	0.444	0.429	0.438	0.038	0.400	0.476	0.044	-0.047
7				0.038	-0.038	0.038	0.038	-0.038
8				0.038	-0.038	0.038	0.038	-0.038
9				0.038	-0.038	0.038	0.038	-0.038
10				0.038	-0.038	0.038	0.038	-0.038
11				0.038	-0.038	0.038	0.038	-0.038
12				0.038	-0.038	0.038	0.038	-0.038
13				0.038	-0.038	0.038	0.038	-0.038
14				0.038	-0.038	0.038	0.038	-0.038
15				0.038	-0.038	0.038	0.038	-0.038

center measurment with ultra sonic

Mean OUTSIDE DIA. Permissible +- 0.015									
Tube	highest	lowest	Mean	Nominal	Tolerance	min	max	min	max
1	0.445	0.439	0.442	0.438	0.015	0.423	0.453	0.019	-0.011
2	0.446	0.440	0.443	0.438	0.015	0.423	0.453	0.02	-0.010
3	0.450	0.431	0.441	0.438	0.015	0.423	0.453	0.0175	-0.013
4	0.442	0.436	0.439	0.438	0.015	0.423	0.453	0.016	-0.014
5	0.453	0.433	0.443	0.438	0.015	0.423	0.453	0.02	-0.010
6	0.448	0.432	0.440	0.438	0.015	0.423	0.453	0.017	-0.013
7			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
8			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
9			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
10			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
11			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
12			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
13			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
14			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!
15			#DIV/0!		0.015	-0.015	0.015	#DIV/0!	#DIV/0!

OUTSIDE DIA. Permissible +- 0.038								
Tube	highest	lowest	Nominal	Tolerance	min	max	min	max
1	0.445	0.439	0.438	0.038	0.400	0.476	0.045	-0.037
2	0.446	0.440	0.438	0.038	0.400	0.476	0.046	-0.036
3	0.450	0.431	0.438	0.038	0.400	0.476	0.050	-0.045
4	0.442	0.436	0.438	0.038	0.400	0.476	0.042	-0.040
5	0.453	0.433	0.438	0.038	0.400	0.476	0.053	-0.043
6	0.448	0.432	0.438	0.038	0.400	0.476	0.048	-0.044
7				0.038	-0.038	0.038	0.038	-0.038
8				0.038	-0.038	0.038	0.038	-0.038
9				0.038	-0.038	0.038	0.038	-0.038
10				0.038	-0.038	0.038	0.038	-0.038
11				0.038	-0.038	0.038	0.038	-0.038
12				0.038	-0.038	0.038	0.038	-0.038
13				0.038	-0.038	0.038	0.038	-0.038
14				0.038	-0.038	0.038	0.038	-0.038
15				0.038	-0.038	0.038	0.038	-0.038

Work Order ID 69799

69799

Page 1

July-03-12 1:04:37 PM

Item ID: D6008-132 Accept *N9000040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Crosstube extrusion
 Start Date: 5/19/11 Start Qty: 20.00 *20* Cust Item ID:
 Required Date: 7/12/12 Req'd Qty: 20.00 *20* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	-------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr								
D6008	Rev A								

100	PURCHASING	0.00							
100									
Purchasing	Memo	0.00							
Purchasing	Issue P/O: 14138								

- a) Order as per Dwg D6008
- b) Material: 3.250 x 0.438 wall 7075-T6/T6511 (WW-T-700/7 or QQ-A-225/9 or QQ-A-200/11) seamless aluminum tube
- c) Minimum ultimate tensile strength = 77 ksi
- d) Minimum tensile yield strength = 66 ksi
- e) Tolerance are per ASTM B210 (see details on Dwg D6008)
- f) Material certification required

110	Receive & Inspect for Damage & Mat'l Certs	0.00							
110									
Packaging	Memo	0.00							
Packaging	Ensure material certification is attached								

4 17-05-19

20

4/11/18

Work Order ID 69799

69799

Page 2

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Item ID: D6008-132 Accept *N9000040100* Setup Start *NS1*
 Revision ID: Stop *NS2*
 Item Name: Crosstube extrusion
 Start Date: 5/19/11 Start Qty: 20.00 *20* Cust Item ID:
 Required Date: 7/12/12 Req'd Qty: 20.00 *20* Customer:
 Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____ Run Start *NR1*
 QC: _____ Date: _____ SPC (Y/N): _____ Date: _____ Stop *NR2*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
120 *120* QC Quality Control	QC6- Inspect dimensions to drawing Memo Ensure Material certification comply to Dwg D6005	0.00 0.00		12/10/12		(20)			
130 *130* Packaging Packaging	Identify as per dwg & Stock Location: 46 Memo	0.00 0.00						12-10-18	(8)
140 *140* QC Quality Control	QC21- Final Inspection - Work Order Release Memo	0.00 0.00						12/12/11	JP

UMP
12-12-10

Picklist Print

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Page 1

Work Order ID: 69799

Parent Item: D6008-132

Parent Item Name: Crosstube extrusion

Start Date: 5/19/11

Required Date: 7/12/12

Start Qty: 20.00

Required Qty: 20.00

Comments: IPP Rev:A New Issue 07-06-18 JLM

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D6008-132P Crosstube extrusion		Purchased	No			110	Each	20.0000	1	20			

Location

Loc Qty

Loc Code

lhall

20

20

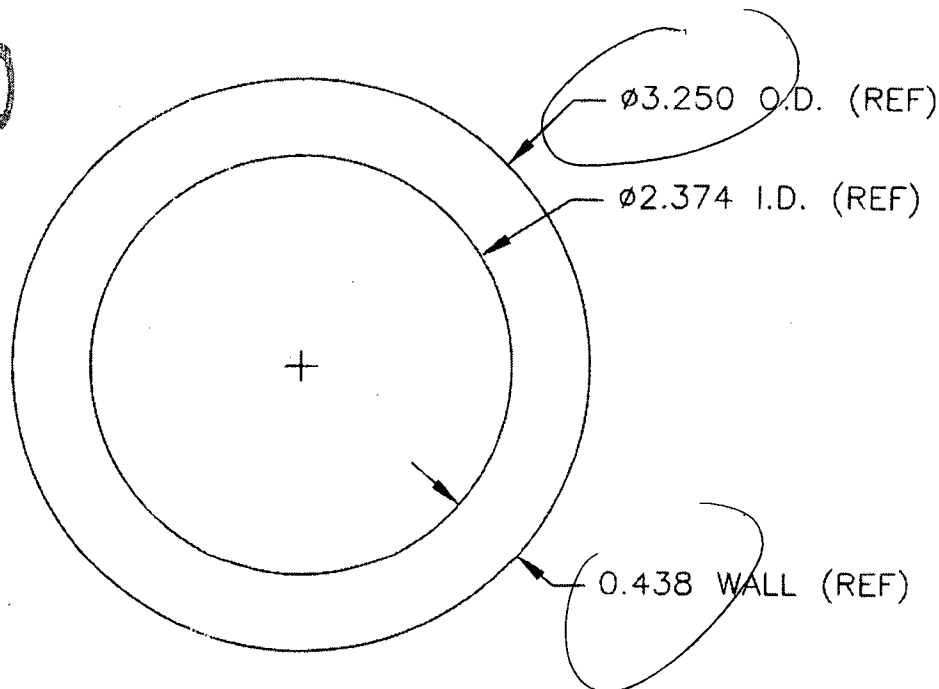
6/12/12
(20)



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>#</i>	APPROVED <i>#</i>	DRAWING NO. D6008	REV. A SHEET 1 OF 1
DATE 00.11.17		TITLE CROSSTUBE MATERIAL SCALE 1:1	
A	00.11.17	NEW ISSUE	

SPECIFICATION CONTROL DRAWING

RELEASED
00.11.24 *#*



NOTES

- 1) D6008-XXX CROSSTUBE
LENGTH

WHERE XXX IS LENGTH IN INCHES
EG. 180" LONG TUBE: D6008-180

- 2) MATERIAL: 3.250 OD x 0.438 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ASTM B210 AS FOLLOWS:
O.D.: ± 0.008 MEAN (± 0.016 INCLUDING OVALITY)
WALL: ± 0.020 MEAN (± 0.044 INCLUDING ECCENTRICITY)
LENGTH: XXX $+0.125/-0.000$
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

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10	1935	1935	1935	1935	1935
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1935	1935	1935	1935	1935	1935
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EXTRUSION INSPECTION SHEET

ULTRA SONIC MEASUREMENTS

TUBE #	TOTAL LENGTH	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Strightness at 12"	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
DWG	132.00"	3.250" OD	2.374" ID	0.438"	0.010"	N/A	66" Middle				
1	132.00"	3.249"/3.243"	2.369"	0.431"/0.441"	0.022"	N/A	66" Middle	0.453"	0.444"	0.446"	0.453"
2	132.00"	3.245"/3.251"	2.365"	0.431"/0.444"	0.035"	N/A	66" Middle	0.450"	0.453"	0.446"	0.442"
3	132.00"	3.247"/3.249"	2.365"	0.38"/0.441"	0.011"	N/A	66" Middle	0.446"	0.446"	0.449"	0.448"
4	132.00"	3.251"/3.246"	2.364"	0.465"/0.423"	0.030"	N/A	66" Middle	0.441"	0.457"	0.446"	0.438"
5	132.00"	3.256"/3.252"	2.362"	0.452"/0.440"	0.029"	N/A	66" Middle	0.450"	0.450"	0.448"	0.448"
6	132.00"	3.243"/3.247"	2.360"	0.438"/0.444"	0.032"	N/A	66" Middle	0.451"	0.446"	0.446"	0.448"
7	132.00"	3.243"/3.249"	2.363"	0.439"/0.443"	0.034"	N/A	66" Middle	0.436"	0.451"	0.455"	0.444"
8	132.00"	3.252"/3.244"	2.356"	0.451"/0.437"	0.029"	N/A	66" Middle	0.444"	0.446"	0.446"	0.449"
9	132.00"	3.242"/3.238"	2.358"	0.444"/0.438"	0.034"	N/A	66" Middle	0.435"	0.449"	0.455"	0.444"
10	132.00"	3.252"/3.249"	2.358"	0.452"/0.435"	0.032"	N/A	66" Middle	0.442"	0.448"	0.448"	0.444"
11											
12											
13											
14											
15											
PART # D6008-132		P/O# 14138		BATCH # 69779		Notes: tube #4 found to have a wall tickness issue see attached sheet					

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

EXTRUSION INSPECTION SHEET

		SIDE A	SIDE B			SIDE A / B		ULTRA SONIC MEASUREMENTS				
TUBE #	TOTAL LENGTH	DIA two readings	DIA two readings	INSIDE DIA	wall thickness measured w/vern	Strightness at 12"	Rockwell Reading	LOCATION on tube	R1	R2	R3	R4
DWG							N/A	Middle	N/A			
1		3.245 / 3.252	2.242 / 2.246	2.360	2.432 / 4.454	.024 / .012	N/A	Middle				
2		3.240 / 3.245	2.231 / 2.245	2.360	.440 / .443	.011 / .010	N/A	Middle				
3		3.243 / 3.244	2.246 / 2.241	2.360	.440 / .443	.010 / .015	N/A	Middle				
4		2.251 / 2.249	2.246 / 2.257	2.360	.444 / .447	.015 / .013	N/A	Middle				
5		2.245 / 2.250	2.247 / 2.243	2.364	.438 / .445	.023 / .016	N/A	Middle				
6		2.243 / 2.248	2.239 / 2.244	2.363	.436 / .447	.017 / .017	N/A	Middle				
7		2.244 / 2.240	2.246 / 2.251	2.360	.440 / .444	.026 / .012	N/A	Middle				
8		2.245 / 2.247	2.244 / 2.246	2.360	.441 / .445	.024 / .022	N/A	Middle				
9		2.241 / 2.244	2.247 / 2.246	2.360	.439 / .448	.033 / .012	N/A	Middle				
10		2.241 / 2.243	2.243 / 2.249	2.364	.437 / .448	.041 / .020	N/A	Middle				
11		2.246 / 2.251	2.240 / 2.247	2.363	.447 / .437	.037 / .016	N/A	Middle				
12		2.241 / 2.249	2.240 / 2.247	2.362	.435 / .441	.042 / .027	N/A	Middle				
13		2.244 / 2.249	2.245 / 2.244	2.361	.437 / .445	.044 / .018	N/A	Middle				
14		2.246 / 2.250	2.245 / 2.248	2.363	.439 / .445	.047 / .008	N/A	Middle				
15		2.250 / 2.247	2.244 / 2.246	2.360	.438 / .443	.046 / .020	N/A	Middle				
16		2.249 / 2.246	2.243 / 2.249	2.360	.436 / .445	.049 / .018	N/A	Middle				